P-25 User Manual

Electric

60010051	**P-25 E COMPLETE**
60010083	**P-25 FULL ASSY-3PHASE**
60010097	**P-25 FULL ASSY-480V-3PHASE-D8-1.5**
60010111	**P-25-E-LOHP COMPLETE**

Revision 7 – 07/15/09

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Dear Customer,

Before starting this machine please complete the following;

Machine Date of purchase……..

Machine serial number……

Please read the following information contained within this manual and fully familiarize yourself with the equipment.

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Section 1 - General Safety information

Danger

Follow these instructions very carefully, in order to avoid injury to yourself or others.

Hydraulic powered machine.
Always ensure that all power to the machine has been turned off and isolated, i.e. The hydraulic power pack must be turned off and prevented from being started before ANY maintenance / repair work is carried out on the machine.

Electrically powered machine.
Always ensure that all power to the machine has been turned off and isolated before ANY maintenance / repair work is carried out on the machine.

Ensure that all guards are correctly fitted before starting or attempting to operate the machine.

Ensure that all fasteners are present and correctly fitted before attempting to start or operate the machine.

Ensure that the pump unit is correctly fastened to the front of the hopper unit of the machine, and free of damage before attempting to start or operate the machine.

Ensure that the hydraulic motor, the flange and the hydraulic hoses are correctly fitted and free from damage before attempting to start or operate the machine.

The P-25 pump unit can produce high pressures, high torques and can use high voltages. Authorized persons when using and working with this machine must take care.

Section 2 - Machine Description

Function

The machine has a drive motor, that turns a drive shaft within a material hopper that in turn feeds a progressive cavity rotor stator pump unit that delivers the material from the hopper to the dispense head via a material hose / hoses.

The machine is driven by an electric motor powered by 220VAC 3 phase 50/60Hz, via an electronic variable speed inverter supplied by two-phase 220VAC 50/60 Hz OR a 3-phase supply of 220VAC or 480VAC

Both version of drives transmit their rotary action through a drive shaft equipped with bridge breakers, which help to mix and convey the material from the hopper towards the pump unit.

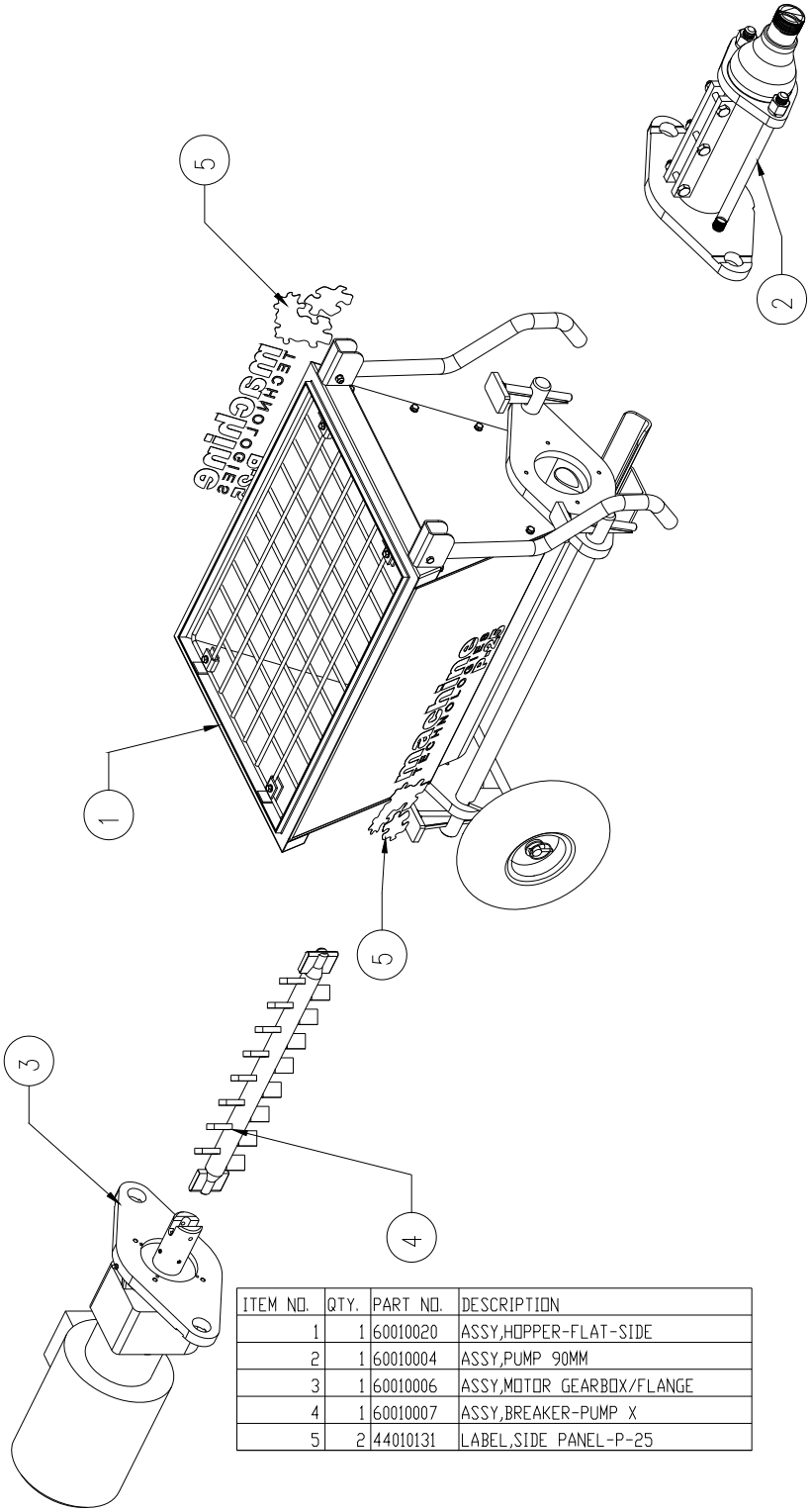
The pump unit is a progressive cavity pump unit comprising of a helical rotating “rotor” with the rubber lined “stator”. As material is drawn / fed into the pump unit it is forced through a series of cavities that deform, causing the material to be moved from the hopper towards the outlet.

Once the material has reached the outlet it is guided through an output flange assembly, into the dispense hose through to the hose outlet, where typically a spray nozzle is attached allowing, with the assistance of an auxiliary air supply, the material to be “sprayed” on to the substrate.
A number of different devices can be fitted to the outlet of the tube for different means of application. For details of these different devices please contact your supplier of Machine-Technologies equipment or Machine-Technologies directly.

Machine illustrations

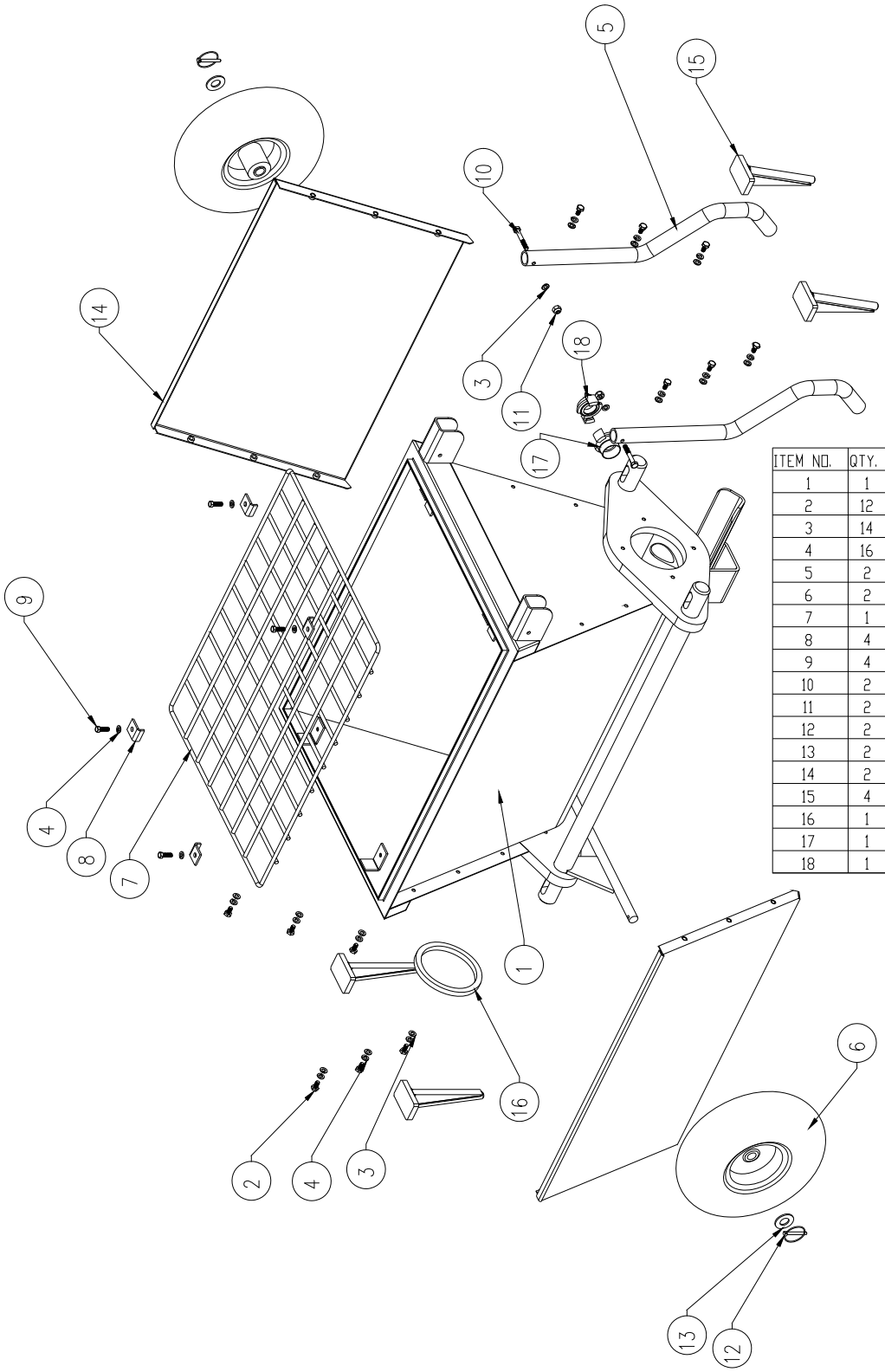
Machine

D8-1.5 rotor stator pump illustrated.



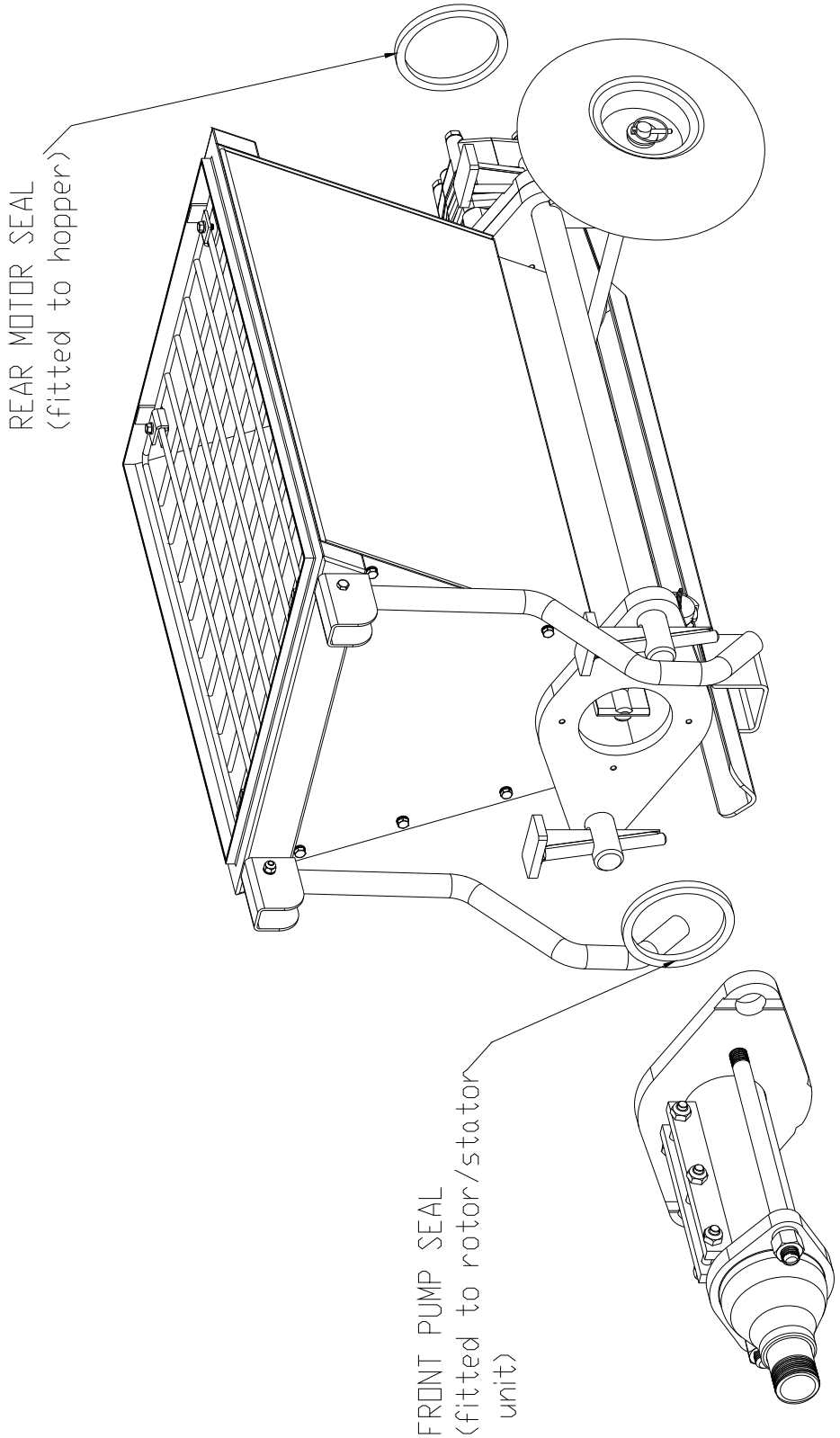
ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	60010020	ASSY,HOPPER-FLAT-SIDE
2	1	60010004	ASSY,PUMP 90MM
3	1	60010006	ASSY,MOTOR GEARBOX/FLANGE
4	1	60010007	ASSY,BREAKER-PUMP X
5	2	44010131	LABEL,SIDE PANEL-P-25

Hopper unit



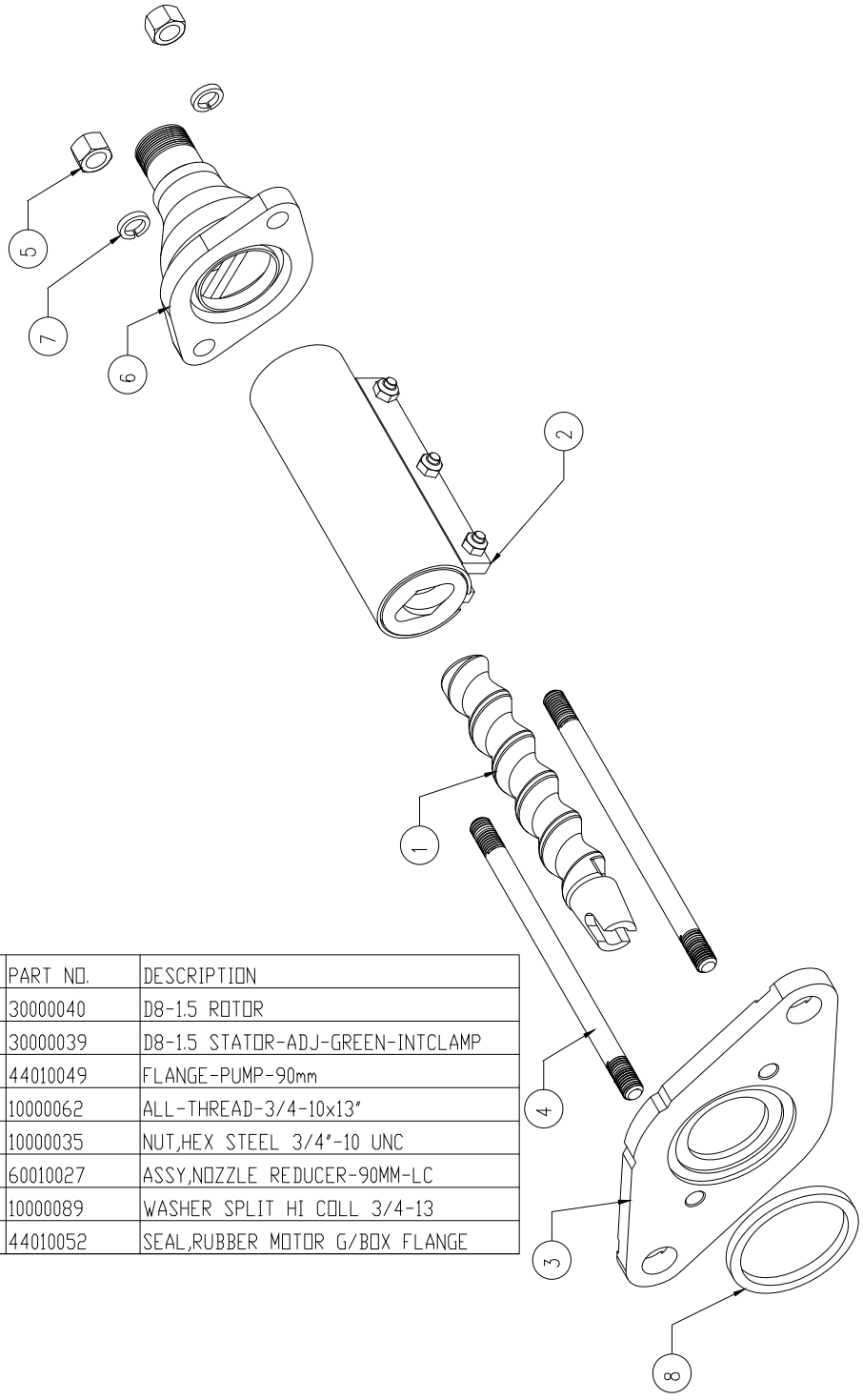
ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	60010009	ASSY,HOPPER WELDED-PUMP X
2	12	10000065	BOLT HEX 1/4-20x1/2"
3	14	10000009	WASHER,FLAT 1/4"
4	16	10000008	WASHER,SPLIT 1/4"
5	2	44010041	HANDLE,CARRYING-HOPPER
6	2	30000016	TIRE,10" PNEUMATIC-5/8" BORE,3 1/2"WIDE
7	1	60010019	ASSY,GRID HOPPER ASSY
8	4	44010042	KEEPER,PLATE GRID HOPPER
9	4	10000015	BOLT,HEX 1/4-20x0.75"
10	2	10000016	BOLT,HEX 1/4-20UNC-1-3/4"
11	2	10000017	NUT,NYLOK 1/4-20 UNC
12	2	10000086	PIN,LINCH 3/16x1-1/8x1-3/8SHK
13	2	10000019	WASHER,AXLE 5/8"-1.313"X0.093"
14	2	60010021	ASSY,FLAT SIDE PANEL
15	4	60010071	ASSY,WEDGE 2 PART
16	1	44010052	SEAL,RUBBER MOTOR G/BOX FLANGE
17	1	40000010	GEKA STYLE FITTING 1" NPT FEMALE
18	1	40000011	GEKA STYLE HOSE END CAP

Front and rear seal location



Pump Unit

“D” pump series – Typical delivery 106 ft³/hr @ 400 RPM



ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	30000040	D8-1.5 ROTOR
2	1	30000039	D8-1.5 STATOR-ADJ-GREEN-INTCLAMP
3	1	44010049	FLANGE-PUMP-90mm
4	2	10000062	ALL-THREAD-3/4-10x13"
5	2	10000035	NUT,HEX STEEL 3/4"-10 UNC
6	1	60010027	ASSY,NOZZLE REDUCER-90MM-LC
7	2	10000089	WASHER SPLIT HI COLL 3/4-13
8	1	44010052	SEAL,RUBBER MOTOR G/BOX FLANGE

**Outputs are theoretical and typically 25% higher than seen in practice. Outputs are also subject to material type, moisture levels, application method and as such testing should be performed to establish suitability.

Available Rotors and Stators

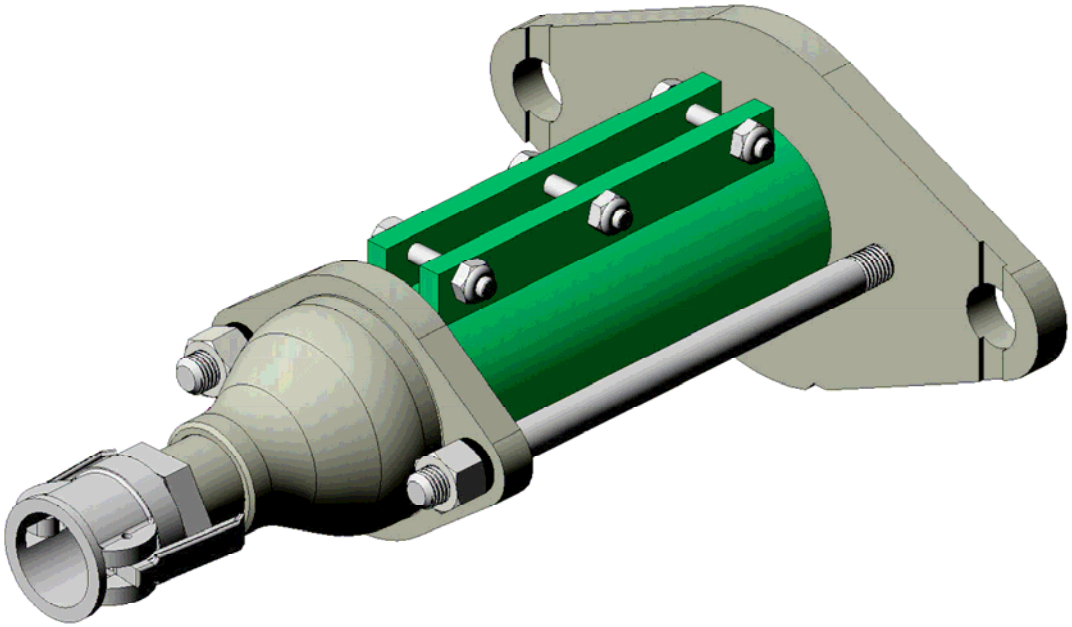
Other rotor and stator units are available for the P-25 pump unit, which will simply replace items 1 and 2 in the previous illustration with the following (D8-1.5 repeated), giving either a reduced output with high pressure, or even lower output and higher pressure.

30000039 D8-1.5 STATOR-ADJ-GREEN-INTCLAMP
30000040 D8-1.5 ROTOR

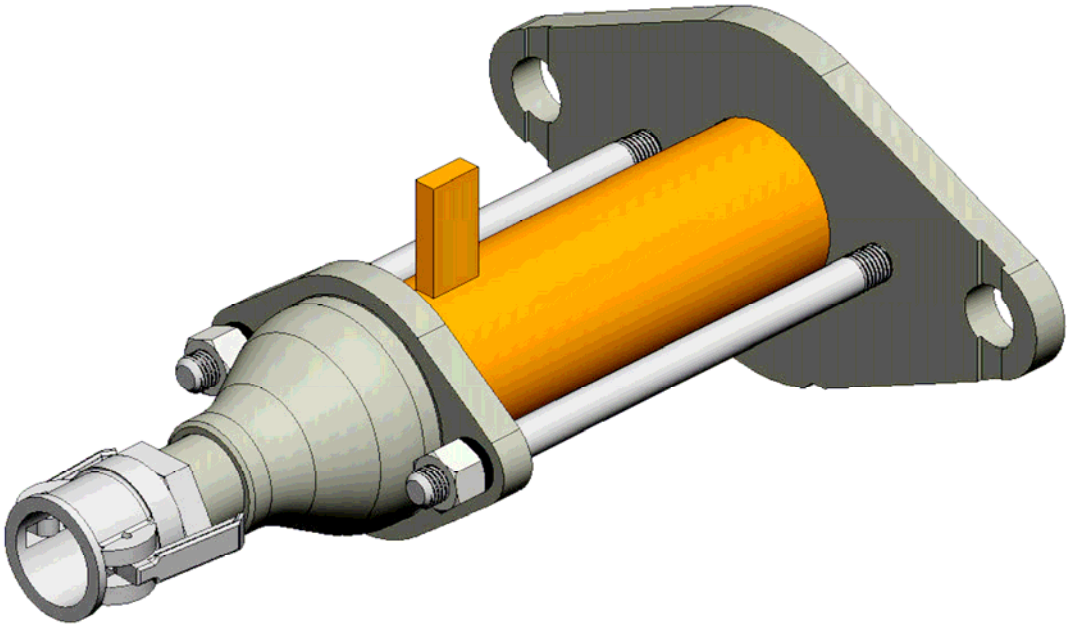
30000041 D6-3 STATOR-FIXED-ORANGE
30000042 D6-3 ROTOR

30000043 D4-3 STATOR-FIXED-GREEN
30000044 D4-3 ROTOR

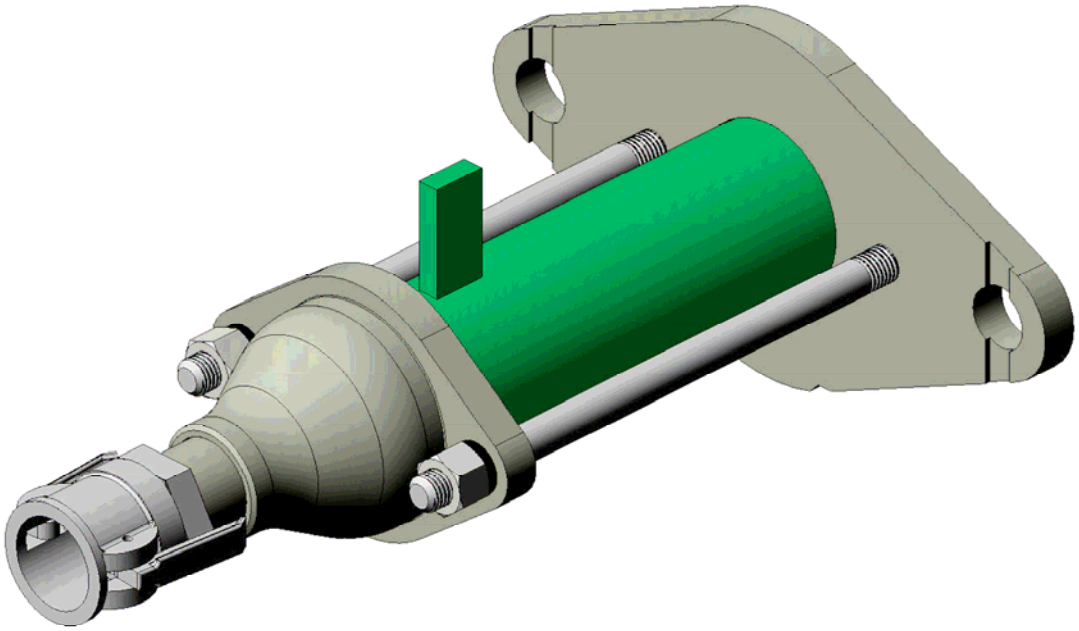
Available pump assemblies



60010004 – D8-1.5 pump assembly



60010095 – D6-3 pump assembly

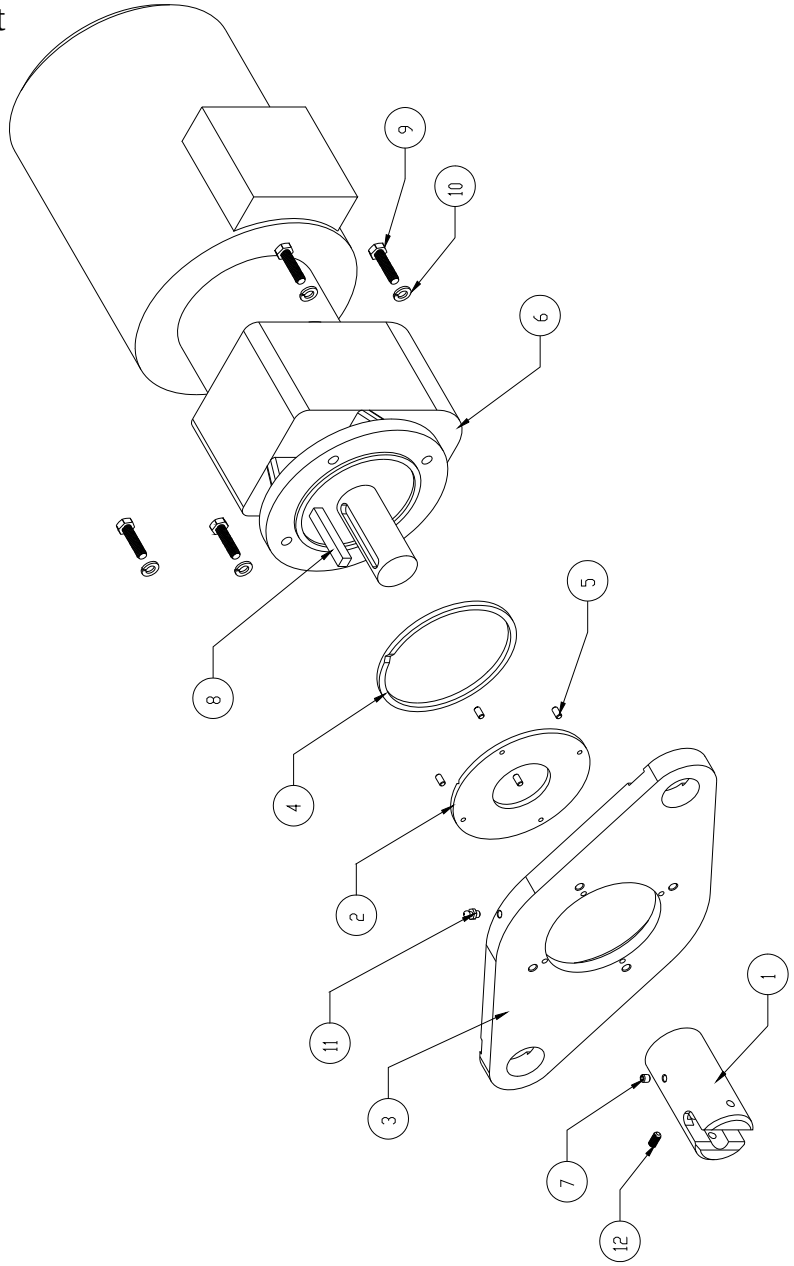


60010110 – D4-3 pump assembly

Drive unit

The machine is supplied with an inverter duty, dual voltage 3phase electric motor drive.

Electric Drive unit

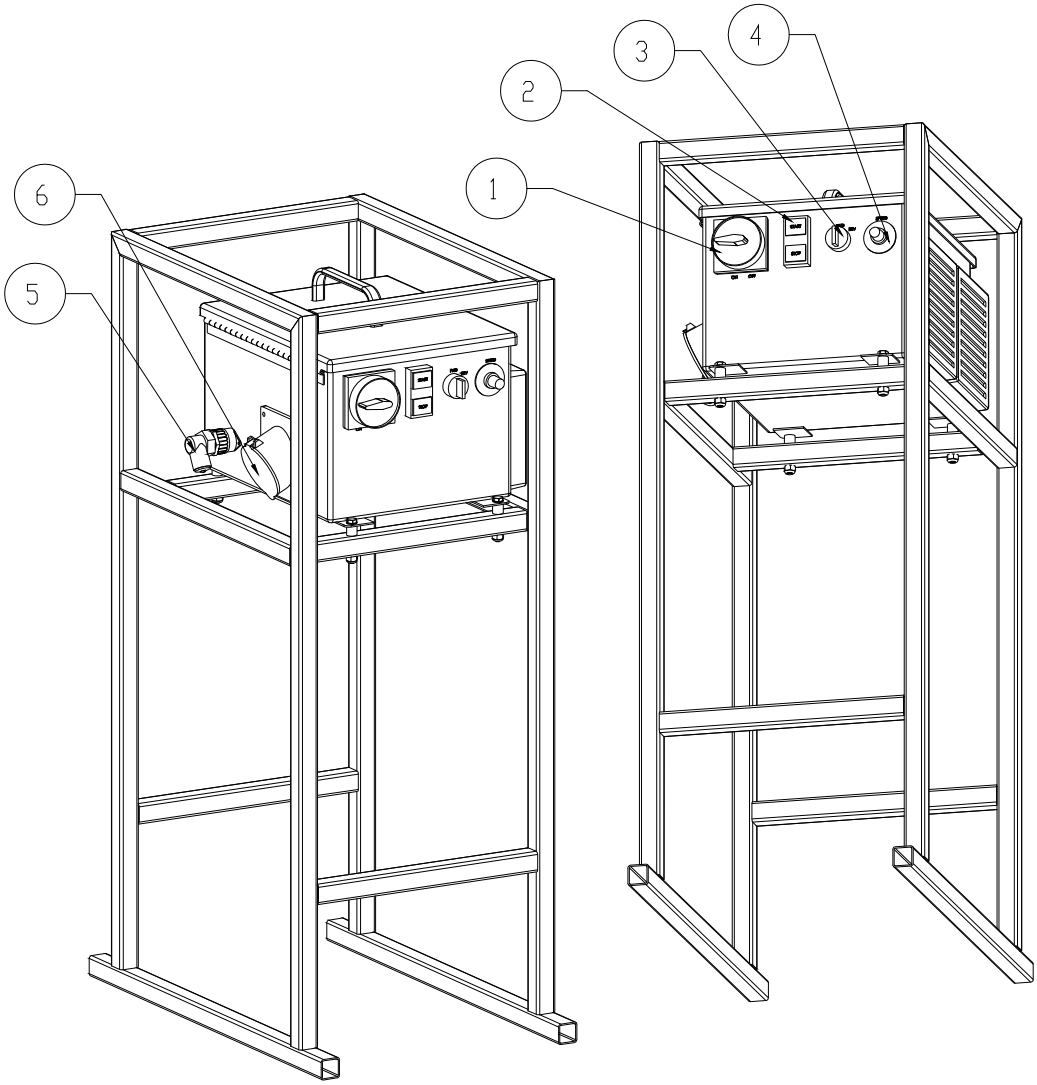


ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	44010011	DRIVE, AUGER PUMP X
2	1	44010013	SEAL,GREASE MOTOR G/BOX
3	1	44010008	FLANGE-MOTOR-MACHINED
4	1	44010014	ADAPTER,MOTOR-FLANGE
5	4	10000002	DOWEL, SEAL RETAINER
6	1	20000004	MOTOR-GEARBOX,ABM-4KW
7	1	10000005	SCREW,SET 1/4-20x1/4"
8	1	44010015	KEY,SPECIAL, DRIVE DOG 35 DIA SHAFT
9	4	10000068	BOLT HEX 5/16-18 UNC 1 1/4" LONG
10	4	10000069	WASHER,SPLIT 5/16"
11	1	40000004	NIPPLE,GREASE-1/4"-28
12	1	10000099	SCREW,SET 1/4-20-1/2LNG

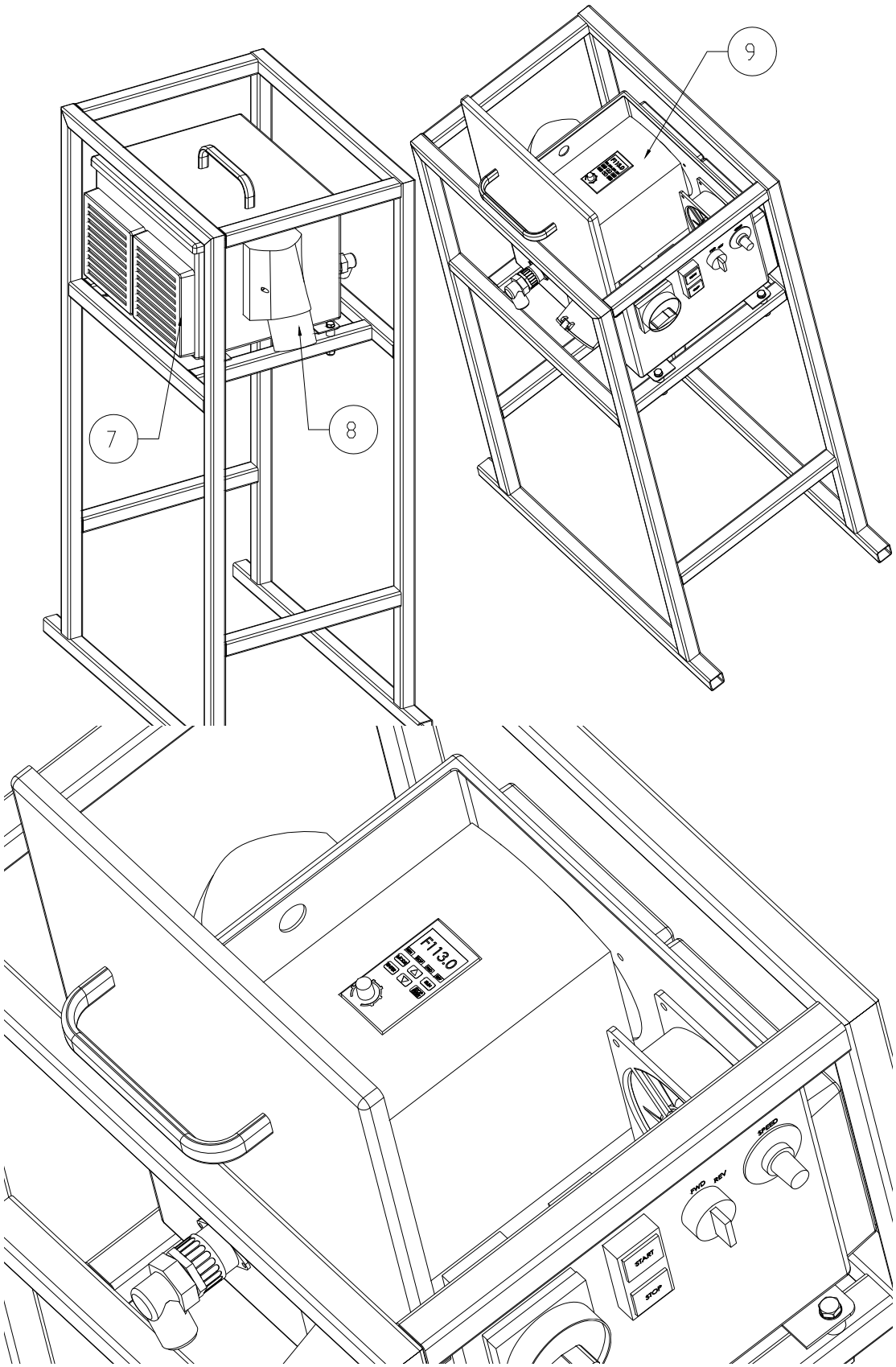
Note – GREASE ON A DAILY BASIS.

Electronic Drive module

The electronic Drive module comprises of a variable speed frequency inverter, allowing the use of 220VAC two or three phase (model dependent) to run the high torque 3 Phase gear motor. The unit is rated at 7.5 HP providing plenty of power to run the P-25 unit. The module is supplied with an input plug allowing immediate wiring into your own 220VAC two or three phase supply (Must be carried out by an approved installer). The motor is supplied with a pre-wired plug that fits into the 3 Phase outlet of the module. The module has a main power isolator, a combined stop / start push button, a reverse switch, a speed control potentiometer, internal breakers, for each input phase, a large capacity cooling fan in addition to the fan fitted to the inverter, and a remote socket, providing the optional capability for remote operation.
A carrying handle is provided on the top of the module for convenient re-location around the job site.



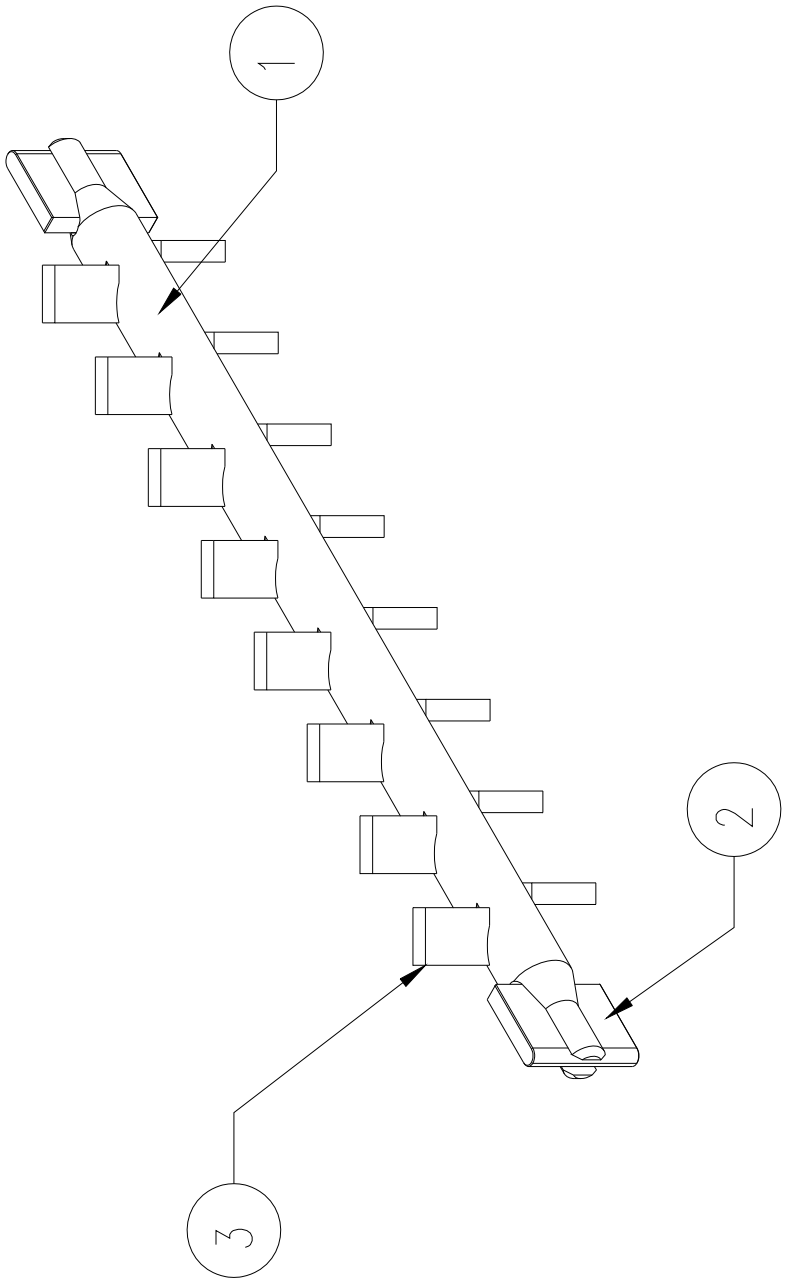
1-Mains isolator 2-Start/Stop buttons 3-FWD/REV switch 4-Speed control
5-Remote plug/connector 6- 3 ph power out connector



7-fan filter covers 8-Two or three phase mains power inlet 9-Inverter drive

Drive Shaft with bridge breakers

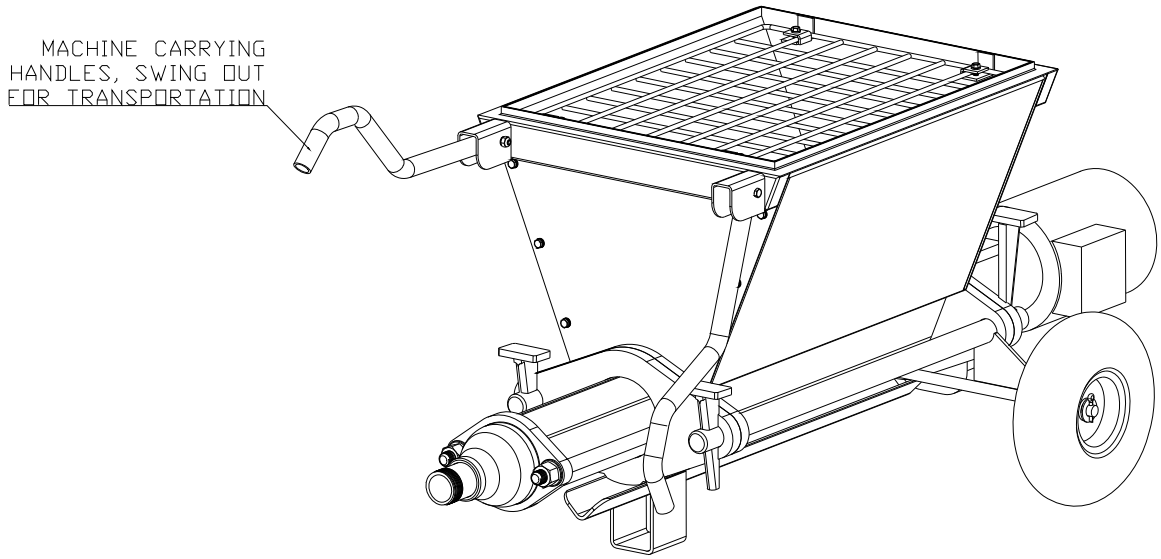
The drive shaft couples the motor drive to the pump unit, and allows one to turn the other.
The drive is equipped with bridge breakers, which prevent “bridges” being formed through the material in the hopper and at the same time move material towards the inlet of the pump unit.



1 – Drive shaft 2 – Drive paddle 3 – Bridge breaker

Section 3 – Transportation and positioning

The machine is typically manually transported around the job site using the two carrying handles, and the wheels in a similar manner to a wheelbarrow. The handles swing vertically down and out of the way when not in use.
If the machine is to be permanently positioned then they can be removed and stored for later replacement.



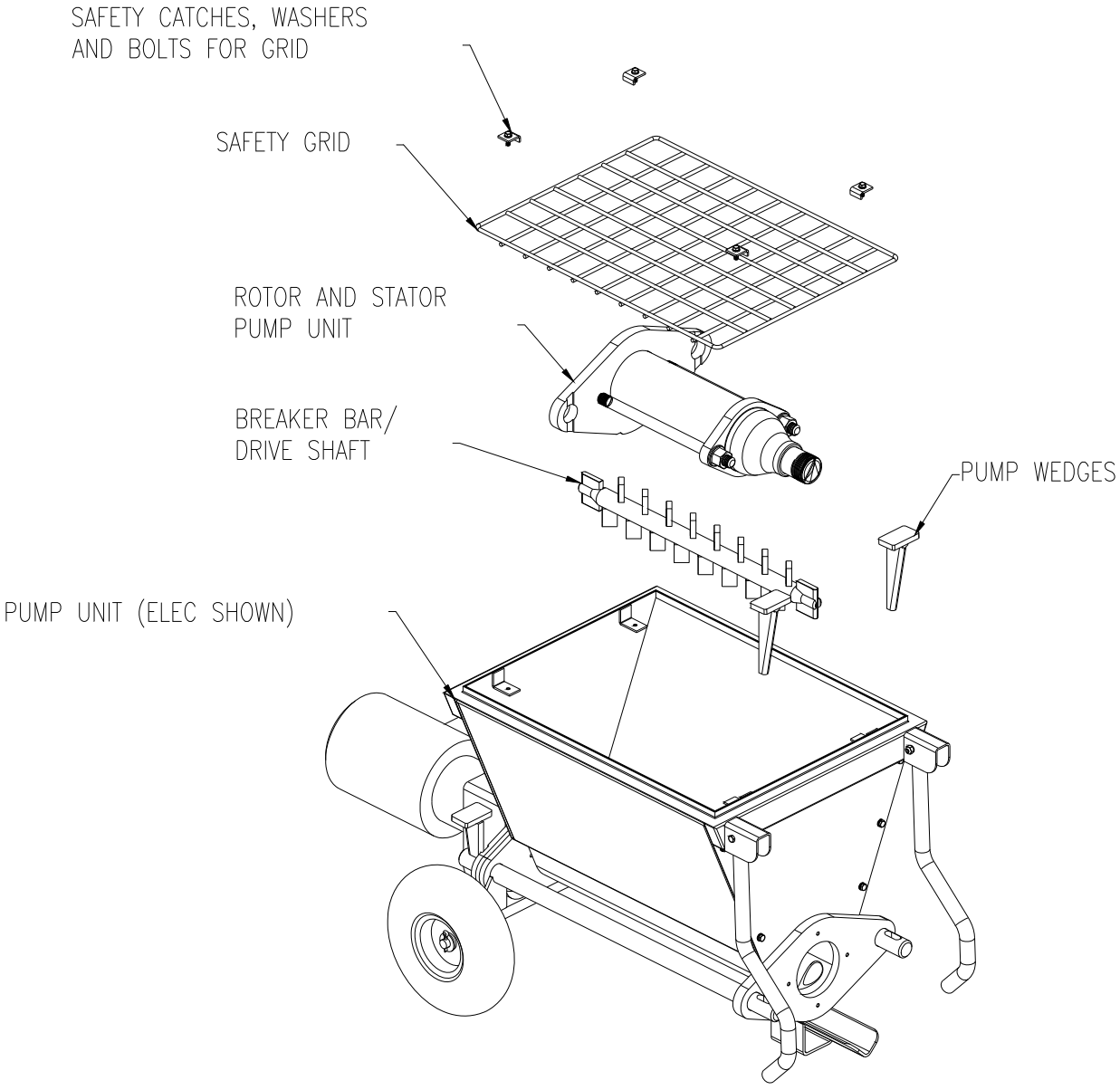
If the machine is being transported between sites, normally the pump unit will have been removed from the front of the machine, due to cleaning between jobs, providing access for lifting hooks around axle on each side of the machine and from the front of the unit.

Section 4 – Machine set up

Unpacking

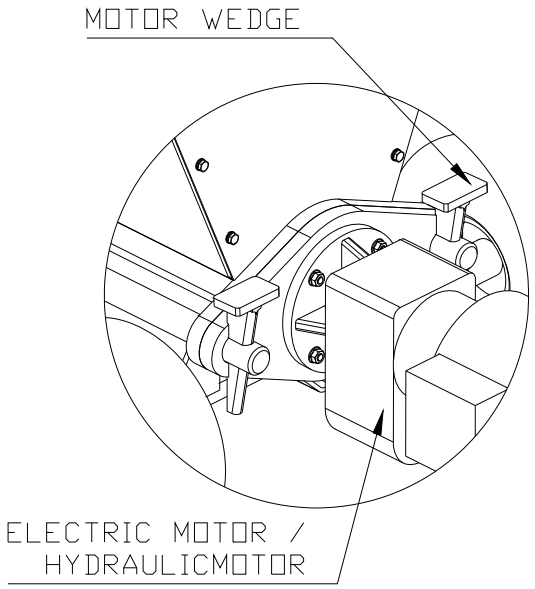
Remove the safety grid from the top of the machine by removing the 4 bolts, clips and washers.
Remove the pump unit, pump wedges and the breaker bar from the hopper.

Consult the final inspection record supplied in the packing for details of your machine and the items checked prior to shipment. Keep this document for your records.

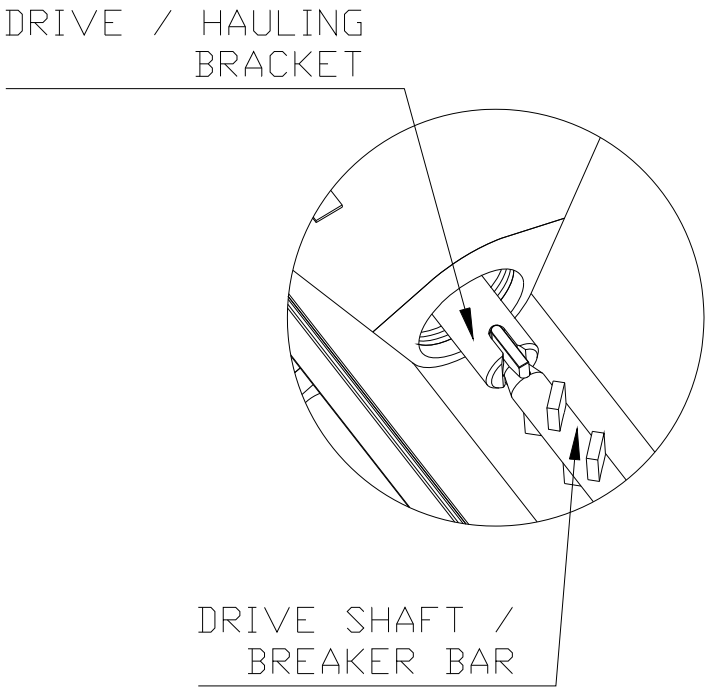

SAFETY CATCHES, WASHERS AND BOLTS FOR GRID
SAFETY GRID
ROTOR AND STATOR PUMP UNIT
BREAKER BAR/ DRIVE SHAFT
PUMP WEDGES
PUMP UNIT (ELEC SHOWN)

Machine assembly

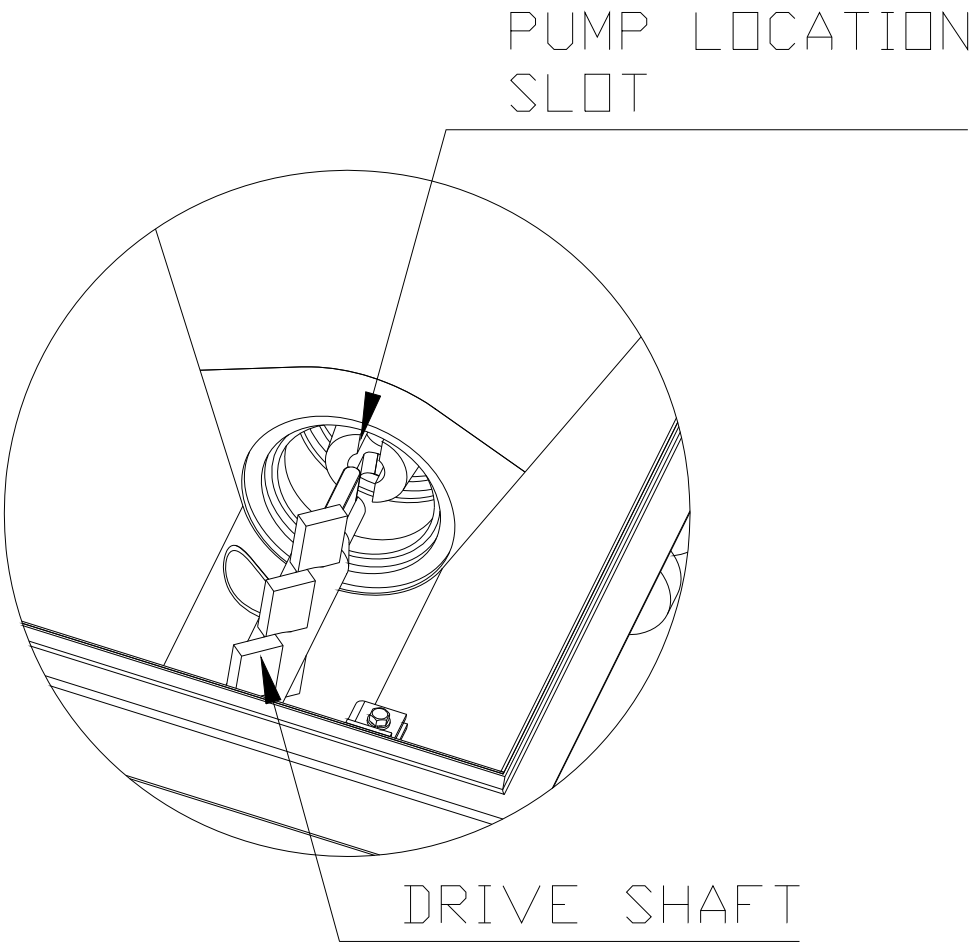
Ensure that the motor wedges are secured and in place.



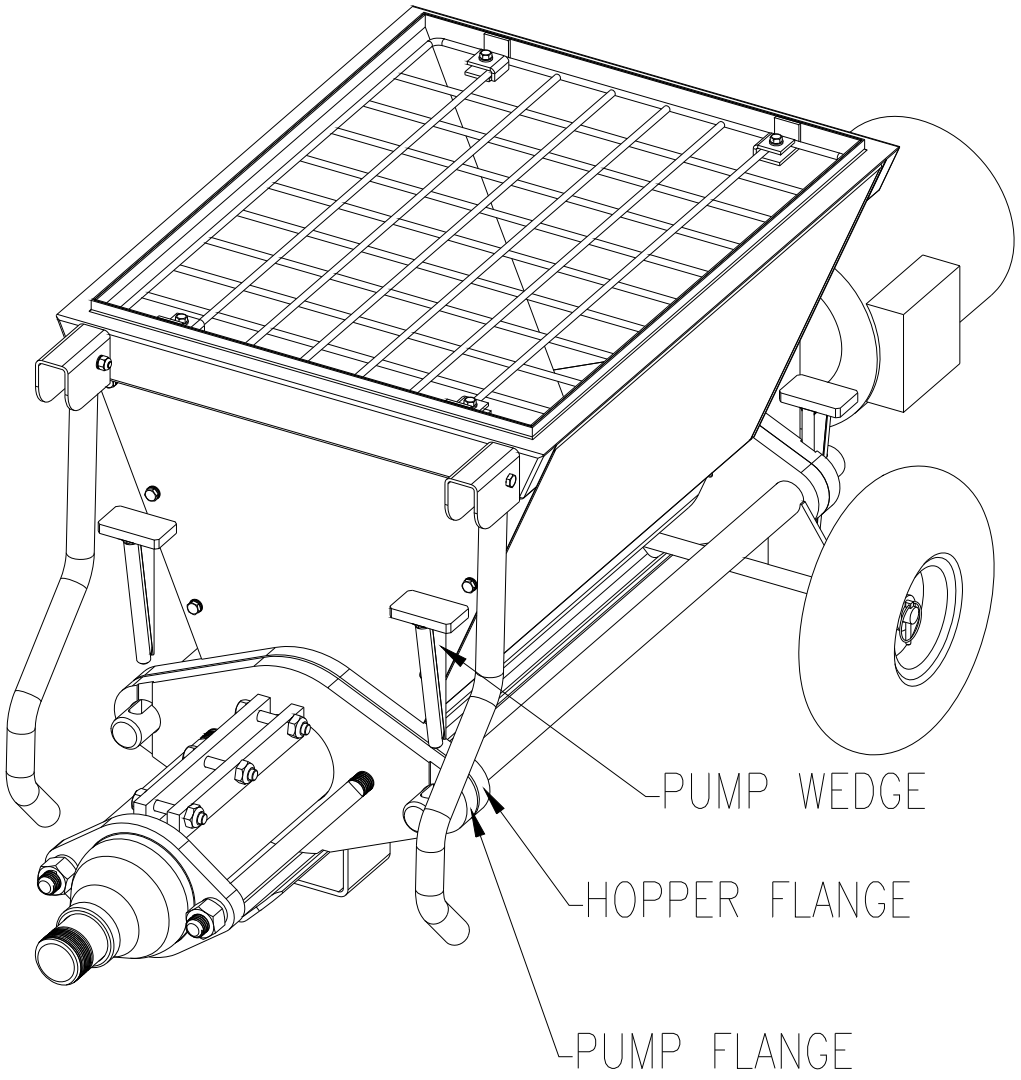
Assemble the breaker bar into the hopper and engage one of the flat ends into the slot in the drive / hauling bracket.



Rotate the drive shaft by hand until the other flat end of the shaft aligns with the approximate position of the slot in the end of the rotor in the pump unit. Slide the pump unit towards the hopper, over the location shafts, locating the drive shaft into the end of the slot in the pump unit.



Ease the pump assembly into position, then assemble the two wedges into the slots. Manipulate the pump unit and the wedges until the pump flange is within 1/8” of the hopper flange, then drive the wedges into position until both flange faces are flush.

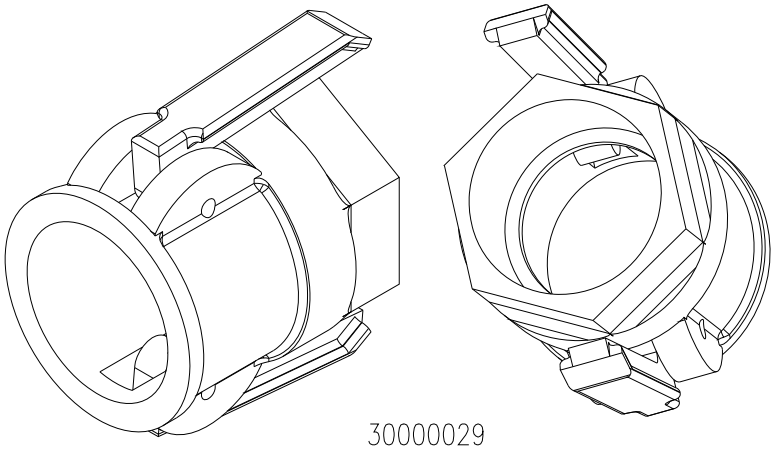


Note: the drive shaft will become tight between the two drive slots during static assembly. Once the unit has been running the compressive force will be reduced or eliminated to within working limits. During pumping the compression will be present, during reverse the compression will be relieved.

Important

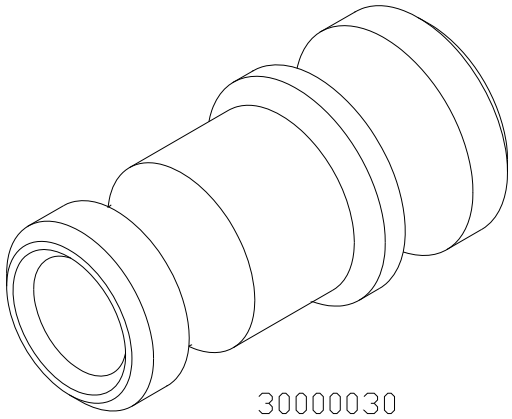
Replace the safety grid back onto the top of the hopper and secure using the 4 clips, bolts and washers. Operation of this machinery without the grid in place is prohibited.

The output of the pump unit is supplied with a female cam-lock style fitting which threads directly onto the output of the pump, giving a 35mm female connection



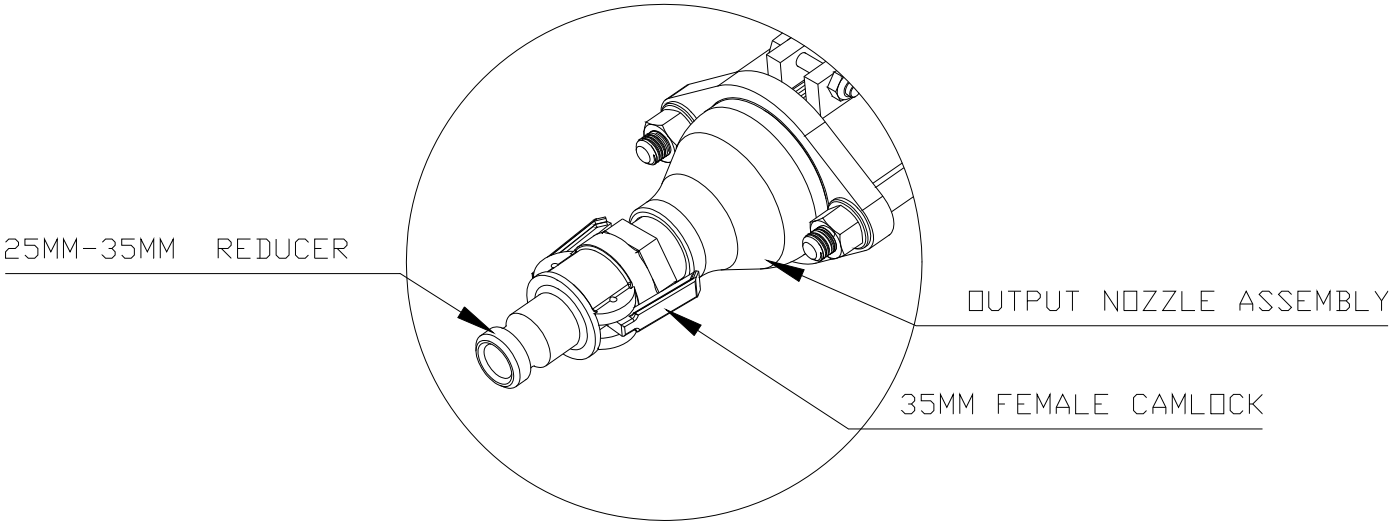
30000029

The output is then further reduced in size to suit the typical hoses used for this lower output pump unit to 25mm using a 25m-35mm male - male reducer.



30000030

Once assembled to the output nozzle assembly the output looks like this



Electrical connections

1. Ensure that there are no power connections to the Electronic drive module.

2. Site the drive module with 6’ of the P-25 unit, as this is the fitted power lead length from the electric drive motor to the connecting plug.

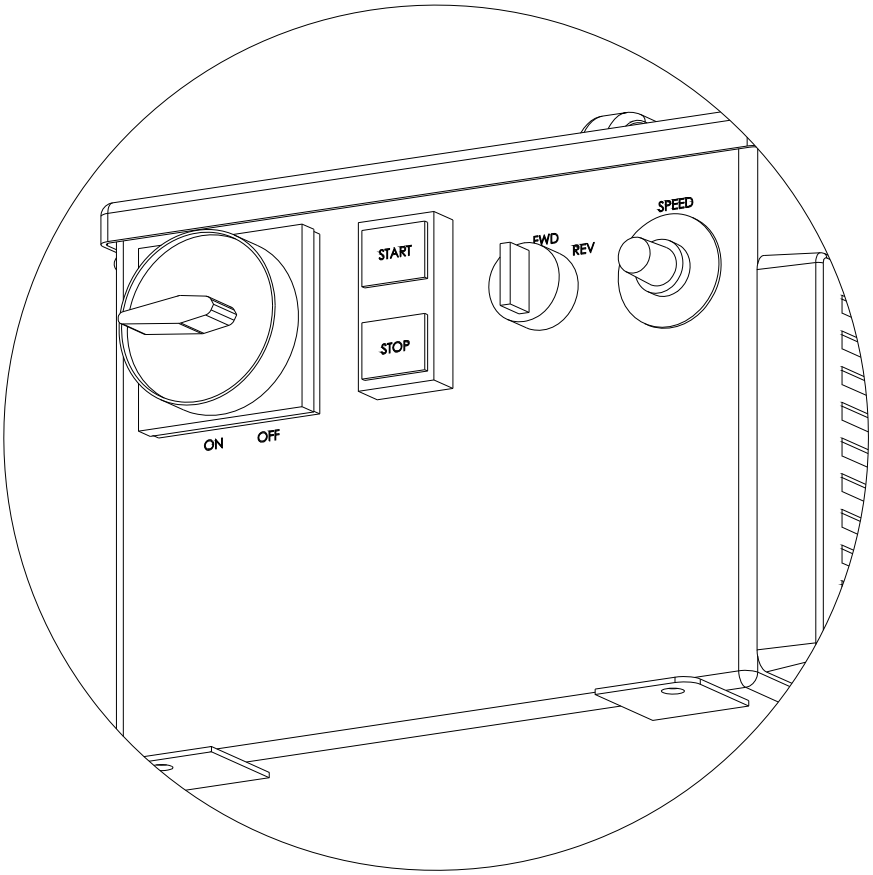
3. Obtain supplied connection lead for the 220VAC feed to the drive module. The length must be such that the delivered voltage to the drive must be 220VAC, and capable of supplying 30A on each leg / phase. Turn the breakers OFF in the box, and remove it from the bus bar to ensure that no voltage exists on the cables.

4. Make the connection between the drive module and the main distribution box, using the supplied electric plug and your supplied cable. Ensure that the Earth is connected, as well as the AC phases.

5. Connect the plug to the drive module, and ensure that the drive module rotary isolator switch is turned OFF.

6. Replace the breakers into the distribution box, onto the bus bar and turn them ON.

7. Turn the drive module isolator to ON, and listen for the cooling fan to turn on.



A qualified individual qualified in the use of electro-mechanical equipment must conduct the following.

Ensure that there are no persons close to the machine.
Ensure that there are no obstructions in or around the machine.
Turn the speed control knob to position 3 on the dial.

8. Press the start button and observe the machine to turn the drive shaft in reverse and then forwards PRESS THE STOP button, within 5 seconds or damage will result to the pump unit.

Note the unit is equipped with an initial motor reverse timer control, in which case when in FWD direction the motor will run in reverse until the timer times out (typically 0.4 seconds), then the unit will function in the normal manner. The reverse function it to help “break” loose the rotor within the pump unit.

When using the supplied wired remote control, the initial reverse function is eliminated.

The pump turns in a counter-clockwise direction when viewed from the motor end of the hopper when pumping.

9. The machine is now ready for use, by trained and qualified operators.

Section 5 – Machine operation / speed setting

The following are to be completed by trained and experienced persons, familiar with the pumping system provided.

1. Connect a hose to the output coupler on the end of the pump unit.
2. Fill the P-25 hopper with water and a suitable lubricant (dish soap).
3. Place the discharge end of the hose, into the hopper, making sure that the end cannot come into contact with the moving parts inside the hopper.
4. Turn on the machine in the FWD direction and observe fluid to be displaced from the hopper through the hose and then back to the hopper, in a recirculatory manner.
5. Using a suitable collection vessel and a stopwatch, time the volume discharged in a given period. Convert this amount displaced into gallons / minute. Compare this figure with your required figure and adjust the speed accordingly.

Do not run the machine with water and lubricant for more than five minutes at a time or damage could result to the pump unit.

General notes for operation

- Grease hauling bracket / drive auger seal daily, with water resistant, corrosion inhibited grease via the grease cert in the motor flange.
- For starting the pump, Ensure that the speed control is at minimum, and direction control are set to forward.
- Turn main power switch on.
- Push start button.
- Adjust speed to desired output.
- Do not let hopper run dry while pump is running.
- To stop machine push the stop button.
- If a hose plugs while pumping, reverse direction on pump to relieve line pressure. Never point hose towards personnel when pump is working.
- When cleaning the pump, do not remove grate while pump is running. Wash out hopper with water and let it run out of the hose. When the hopper is clean run foam balls through hose with clean water. Do not spray water on or in control box. Control box should be wiped down with a damp rag.
- If access is required in to the hopper, disconnect power source before removing grate. Pump can be disassembled by removing wedges, this facilitates easier transport and final clean up.
- Pump is supplied with an adjustable stator. The sleeve can be tightened to bring working pressure back to normal range as the stator wears down. This should be done in small increments. Over tightening the stator will cause premature wear and heat up material.
- Always check hoses and cords for wear.
- The unit runs on high voltage and is capable of high pressures in the hoses.

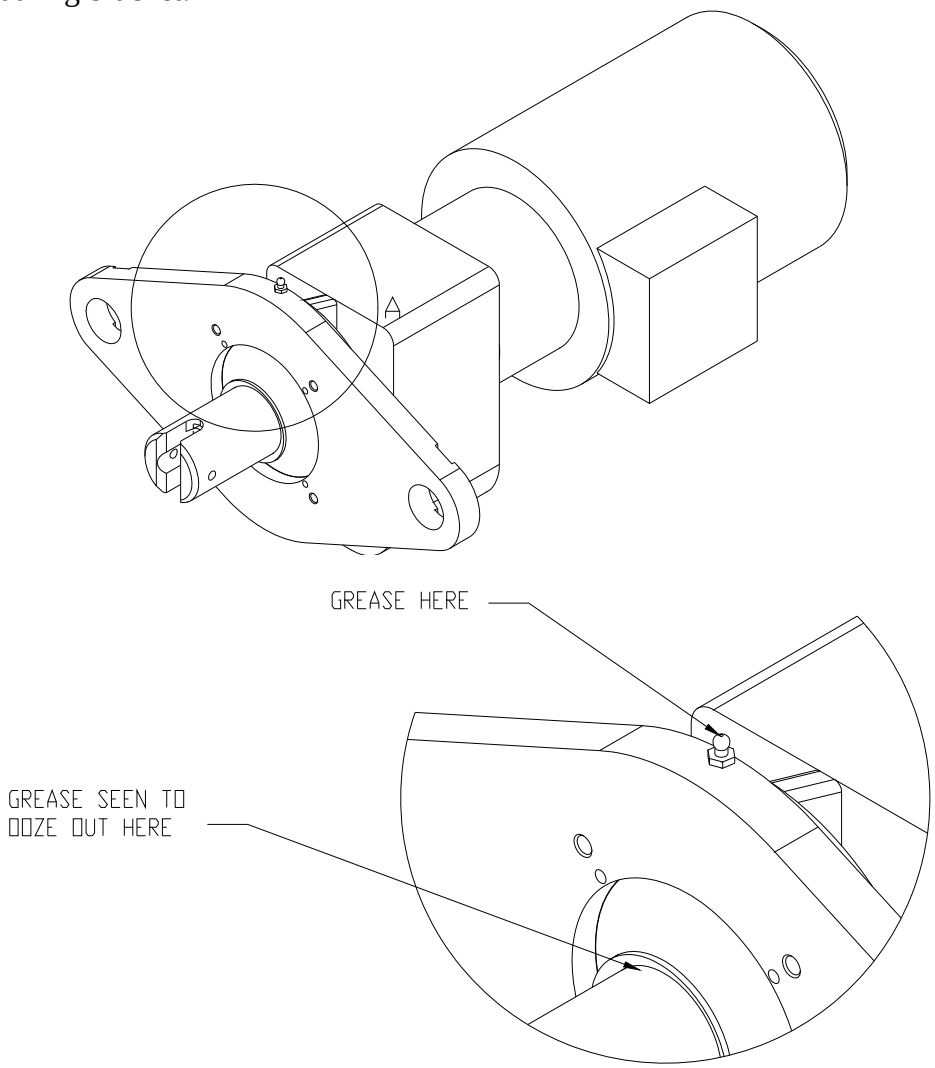
Section 6 – Simple maintenance

The P-25 pump unit is very simple to maintain.

By far the biggest part of maintenance of the P-25 machine is cleaning after a job. Failure to clean properly after use will damage seals, paint, and moving parts due to material build up causing wear.

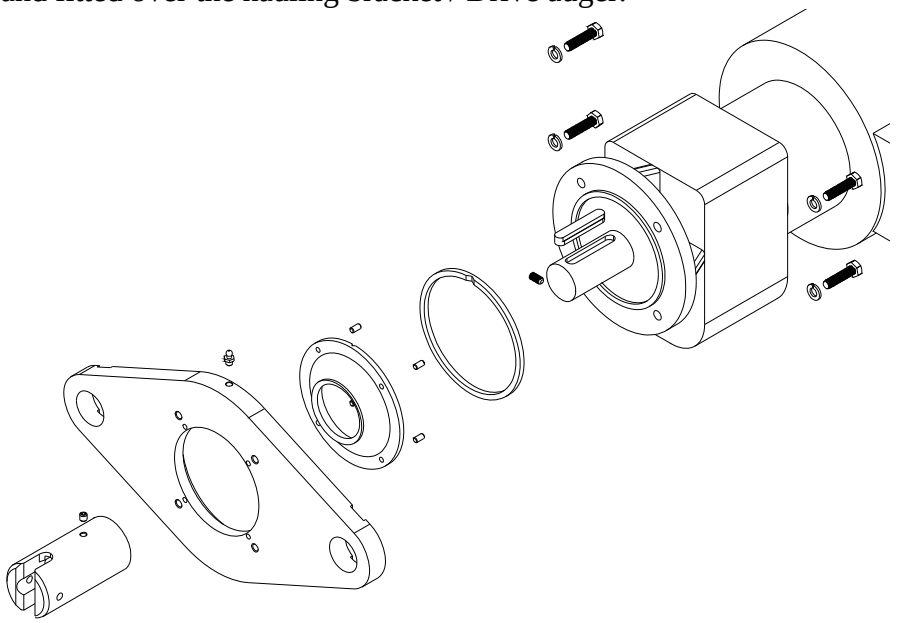
Pay particular attention, when cleaning, to the seals between the Rotor stator flange and the flange on the front of the hopper, to the seal between the motor mounting flange and the rear of the hopper, to the seal around the drive / hauling bracket fixed to the drive flange at the rear of the machine.

Ensure that the seal between the hauling bracket and the motor is greased each day or after each clean down, with a water resistant, corrosion inhibiting, extreme pressure grease. Grease until a small amount of grease can be seen “oozing” from around the hauling bracket.

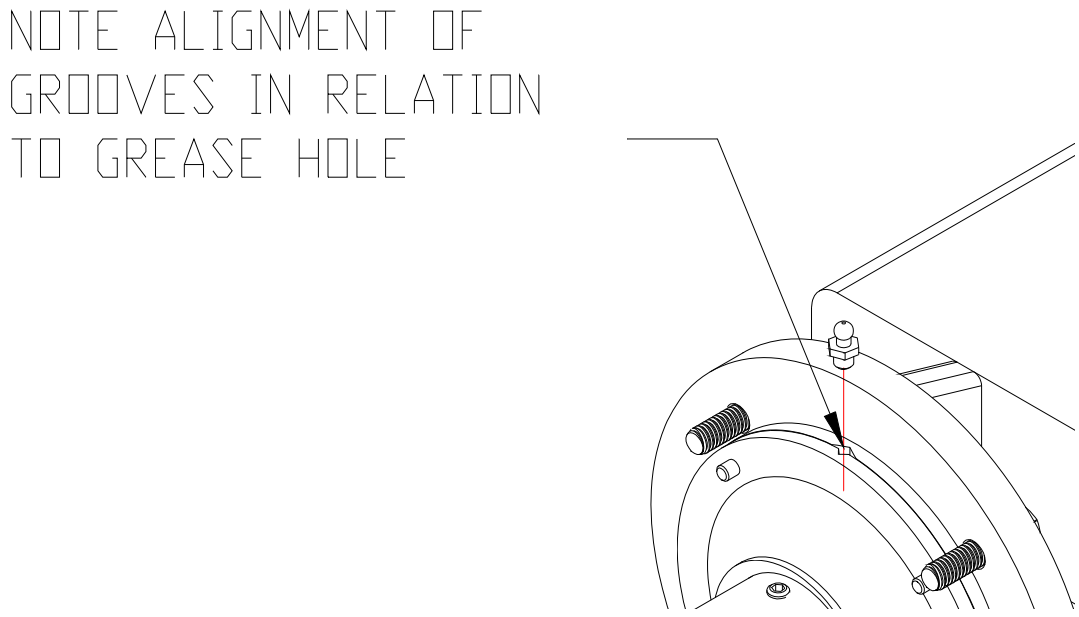


Front seal replacement

The illustration shows the front seal, in a deformed state, as would be seen when full of grease and fitted over the hauling bracket / Drive auger.



Take special note of the grease groove positions of the seal and of the adapter, in relation to the grease hole in the plate and the grease cert. The two grooves together give a path for the grease to get into the cavity.



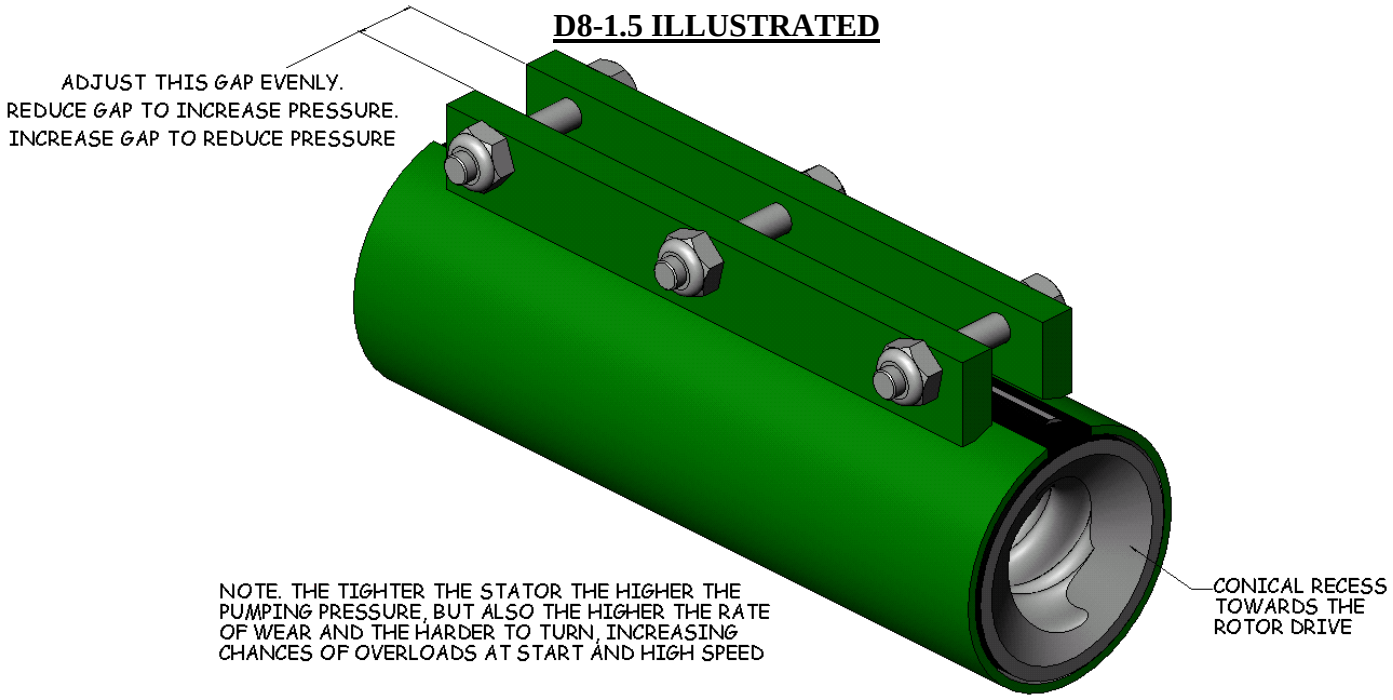
Grease using a high water resistant, high corrosion protection, and extreme pressure type grease, on a daily basis, or after each time the unit is cleaned down

Section 7 – Notes on wear of rotor / stator pump unit

A **Rot**or is the metal corkscrew looking item that **ROT**ates inside the Stator.
A **Stat**or is the **STAT**ionary part that the rotor rotates inside.

Stator adjustment

Some of the Stators supplied are adjustable, some are not.
The adjustable units allow the tightening of some bolts, to squeeze together two flanges, which in turn reduce the diameter of the inside of the stator, allowing a tighter fit around the rotor giving renewed ability to produce higher pressures, similar to when the unit was new.


D8-1.5 ILLUSTRATED
ADJUST THIS GAP EVENLY.
REDUCE GAP TO INCREASE PRESSURE.
INCREASE GAP TO REDUCE PRESSURE
NOTE. THE TIGHTER THE STATOR THE HIGHER THE PUMPING PRESSURE, BUT ALSO THE HIGHER THE RATE OF WEAR AND THE HARDER TO TURN, INCREASING CHANCES OF OVERLOADS AT START AND HIGH SPEED
CONICAL RECESS TOWARDS THE ROTOR DRIVE

Wear issues

Dry running of a rotor-stator pump
A screw pump can only work reliably if there is adequate and appropriate lubrication. The lubricant reduces the friction between the rotor and the stator. If this lubricating film is damaged, high temperatures are reached and the elastomer wears within a very short time. Even if dry running lasts only a few seconds with new parts, the effect resembles that of a wheel spin on a car tire, dramatically affecting length of service.

The use of simple dish soap or specific water based lubricants mixed with water while hose cleaning, or pump priming can dramatically reduce the negative effects of dry running, and help prolong the natural life of the rotor and stator.

Please note. that rotor stator wear is directly related to the amount of work that the unit has to perform. A low-pressure job with a smooth mix will cause less wear than a high-pressure job with smooth mix. A low-pressure job with a course mix will wear more than a low-pressure job with a smooth mix.

The life of a rotor stator combo will need to be determined on a job-by-job basis, being dependent upon the coarseness of the mix and the amount of pressure required.

LIMITED WARRANTY POLICY

Machine Technologies warrants each of its new machines to be free of defects in material and workmanship under normal use and services for a period of one (1) year from the date of delivery.

The warranty is issued ONLY to the INITIAL USER. The warranty period begins when the product is delivered to the initial user or when first put into service, whichever occurs first. Said warranty is void if the machine is subject to misuse, neglect, accident or abuse.

Machine Technologies' obligation under this warranty is limited to correcting without charge, at its warehouse, any parts or parts thereof which shall be returned to its warehouse, transportation/shipping prepaid and upon Machine Technologies' examination proves to have been originally defective. Correction of such defects by repair or replacement shall constitute fulfillment of all obligations to the initial user. This warranty does not include labor or transportation charges unless specifically identified and authorized in writing by Machine Technologies. Nor does the warranty apply to any unit upon which repairs or unauthorized alterations have been made.

The warranty does not apply to normal maintenance service or to normal replacement of certain machine parts which are subject to normal wear (including but not limited to pins, bushings, rotors, stators, hoses, spray caps, spray nozzles, mixing shafts, shaft couplings and connectors, dosing shafts, pump shafts, filter elements and tires).

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